

REMARKS

The Office Action mailed 23 April 2010, has been received and its contents carefully noted. Claims 9-30 were pending and claims 9-20 were rejected. Claims 21-30 were withdrawn from consideration. By this amendment, claims 9-20 and 27-30 have been amended, claims 21-26 are canceled, and claims 31-33 are newly added. Support may be found in the specification and the claims as originally filed. See, for example, page 5, lines 16-18, page 7, lines 13-33, and the detailed examples. New claim 33 is based on former claim 21 and is therefore currently withdrawn. No statutory new matter has been added. Therefore, reconsideration and entry of the claims as amended are respectfully requested.

Claimed Invention

Applicants respectfully submit that the present invention is directed to a composite catalyst for water electrolysis, not an electrode and does not contain an electrically conductive substrate. The composite catalyst comprises high surface area inorganic oxide particles having iridium oxide particles deposited thereon or dispersed around. In other words, the inorganic oxide particles are not formed *in situ*. Instead, the inorganic oxide particles are preformed and then the iridium oxide particles are deposited on or dispersed around the inorganic oxide particles. See specification, page 5, line 16-18.

The inorganic oxide particles have a BET surface area in the range of 50 to 400 m²/g and are present in a quantity of less than 20 wt % based on the total weight of the composite catalyst. Surprisingly, the use of high surface area inorganic oxide particles improves the performance and the lifetime of the catalysts in water electrolysis. See specification, page 6, line 21-25. The resulting catalysts are very active have a high surface area and a low degree of agglomeration. See specification, page 7, lines 16-18 and page 8, lines 1-2.

Rejection under 35 U.S.C. 103(a)

The Examiner rejected claims 9-20 under 35 U.S.C. 103(a) as unpatentable over Kolb (US 3,853,739). Specifically, the Examiner deemed that it would have been obvious and expected that the surface area and water solubility of the binder material would be the same as the binder material is the same as the claimed inorganic oxides. The Examiner also deemed that it would have been obvious to use the binder material at the claimed percentage of inorganic oxide as a matter of routine optimization.

Applicants respectfully submit that Kolb does not teach or suggest the claimed invention, i.e. high surface area inorganic oxide particles having iridium oxide particles deposited thereon or dispersed around. Kolb is directed to the conventional technology of dimensionally stable electrodes used in electrochemical reactions such as chlor-alkali electrolysis, electroplating, etc. See col. 1, lines 6-10 and lines 29-31. Kolb does not teach or suggest iridium oxide particles deposited on or dispersed around high surface area inorganic oxide particles.

Instead, the binders of Kolb are amorphous oxides obtained by thermal decomposition of a solution of the salts of valve metal oxides in the presence of oxygen. See col. 2, lines 20-23. Thermal decomposition at temperatures of 300-600 °C is not expected to result in valve metal oxide powders with high surface areas because, generally, simple salt decomposition processes do not yield high surface area materials unless additional energy for dispersion is brought into the system. Therefore, one of ordinary skill in the art would not expect that the process of Kolb could result in particles having a high surface area, i.e. a BET surface area of at least 50 m²/g.

Nowhere does Kolb teach or suggest depositing or dispersing the iridium onto or around the inorganic oxide particles. Thus, Kolb does not teach or suggest high surface area inorganic oxide particles having iridium oxide particles deposited thereon or dispersed around. Nowhere does Kolb teach or suggest that depositing or dispersing iridium on or around the inorganic oxide particles results in a composite catalyst that is highly active, has a high surface area (i.e. BET surface areas of at least 50m²/g), a low degree of agglomeration and improved performance and longer life as set forth in the instant specification. See page 6, lines 21-25, and page 7, lines 16-18. Thus, Kolb does not teach or suggest the instant invention as claimed.

Therefore, Applicants respectfully assert that the claims are unobvious and the rejection under 35 U.S.C. 103(a) should properly be withdrawn.

Request for Interview

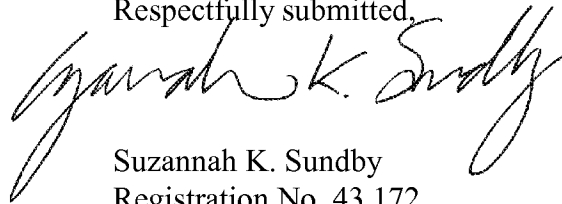
Either a telephonic or an in-person interview is respectfully requested should there be any remaining issues.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Therefore, it is respectfully requested that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Official action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. 1.136(a), and any fees required therefor are hereby authorized to be charged to **Deposit Account No. 024300**, Attorney Docket No. **034166.024**.

Respectfully submitted,



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